Announcing the Final Examination of Ankush Bharati Oberai for the degree of Doctor of Philosophy

Time & Location: October 25, 2018 at 9:30 AM in Harris Corporation Engineering Building HEC 113

Title: SEMICONDUCTOR DESIGN AND MANUFACTURING INTERPLAY TO ACHIEVE HIGHER YIELDS AT REDUCED COSTS USING SMART TECHNIQUES

Since the outset of IC Semiconductor market there has been a gap between its design and manufacturing communities. This gap continued to grow as the device geometries started to shrink. The gap lowered the manufacturing yields, leading to higher costs of ICs and delays in overall time to market. It also impacted performance of the ICs and overall functionality of the systems they empowered. However, in the recent years there have been major efforts to bridge the gap between design and manufacturing using "SMART" collaboration techniques between design and manufacturing communities.

The root cause of this gap is inherited by the difference in the knowledge and skills required by the design and manufacturing communities. The IC design community is more microelectronics, electrical engineering and software driven whereas the IC manufacturing community is more driven by material science, mechanical engineering, physics and robotics. The cross training between the two is almost nonexistent and not even mandated. This gap is deemed to widen with demand for more complex designs and miniaturization of electronic products.

To bridge this gap, it is critical to have close loop "SMART" solutions between design and manufacturing. This could be achieved by "SMART" automation by using Artificial Intelligence, Machine Learning and Big Data algorithms. Lack of automation and predictive capabilities have worsen the situation on the yield and total turnaround times. With the growing fabless and foundry business models, bridging the gap has become even more critical. "Smart" Manufacturing philosophy must be adapted to make this bridge possible. We need to understand the Fab-Fabless collaboration requirements and the mechanism to link design to the manufacturing floor to achieve higher yields. Additionally, design community must be educated with manufacturing processes and tool knowledge to achieve "SMART Design for improved Manufacturing".

Major: Electrical Engineering

Educational Career:
Bachelor's of Electrical Engineering , BS, 1981, Shivaji University , India
Master's of Electrical Engineering, MS, 1983, University of Central Florida

Committee in Charge:
Jiann—Shiun Yuan, Chair, Electrical & Computer Engineering
Michael Georgiopoulos , Electrical & Computer Engineering
Kalpathy B. Sundaram , Electrical & Computer Engineering
Charles H. Reilly , Industrial Engineering & Management Systems
Reza Abdolvand , Electrical & Computer Engineering

Approved for distribution by Jiann-Shiun Yuan, Committee Chair, on September 20, 2018.

The public is welcome to attend.